Color Camera Block

EVI-310/311

Instruction

SONY CORPORATION

a) Page 11: Table should be as follows.

Control method / Controlable functions	FK-56	RM-95	VISCA /RS232C	ECCP	Extra Circuit	
Zoom Tele/Wide	○	○	○	○		
Zoom Position (Preset/Detect)			○	○		
Focus Auto/Manual	○	○	○	○		
Focus Far/Near	○	○	○	○		
Focus Position (Preset/Detect)			○	○		←
White Balance mode selection			○	○	○	
White Balance mode detection			○	○		
Bright Control Up/Down			○	○	○	
Exposure Compensation Up/Down			○	○	○	←
Exp. Compensation (Preset/Detect)			○	○		
Shutter Priority Up/Down			○	○		
Shutter Priority (Preset/Detect)			○	○		
Iris Priority Up/Down			○	○		
Iris Priority (Preset/Detect)			○	○		
Gain Priority Up/Down			○	○		
Gain Priority (Preset/Detect)			○	○		
Position Preset (Preset/Reset)			○	○	○	
Position Preset (Detect)			○	○		

b) Page 8: Table should be as follows

STEP	GAIN	IRIS	STEP	GAIN	IRIS	STEP	GAIN	IRIS	
1	18dB	F1.4	9	0dB	F2	17	0dB	F8	
2	15dB	F1.4	10	0dB	F2.4	18	0dB	F9.6	
3	12dB	F1.4	11	0dB	F2.8	19	0dB	F11	
4	9dB	F1.4	12	0dB	F3.4	20	0dB	F14	
5	6dB	F1.4	13	0dB	F4	21	0dB	F16	
6	3dB	F1.4	14	0dB	F4.8	22	0dB	F19	
7	0dB	F1.4	15	0dB	F5.6	23	0dB	>F22	←
8	0dB	F1.7	16	0dB	F6.8				

note: F number of Step 23 is larger than F22 but it doesn't become CLOSE.

c) Page 9: Iris Priority Mode Table should be as follows

1	F19	11	F3.4
2	F16	12	F2.8
3	F14	13	F2.4
4	F11	14	F2
5	F9.6	15	F1.7
6	F8	16	F1.4
7	F6.8		
8	F5.6		
9	F4.8		
10	F4		

Note: CLOSE is not available at Iris Priority Mode.
F19 is the maximum F No. for Iris Priority Mode.

d) No Iris "CLOSE" mode in EVI-310/311 as long as the power is turned on.

Color Camera Block

EVI-310/311

Contents

1. Summary
2. Specifications
3. Block Diagram
4. Dimension
   - EVI-310/311
   - FK-56 Board
5. Input/Output Terminal
6. Functions
7. Function Control
8. Operation
9. Installation
10. Note
11. Others
12. Optional Accessories

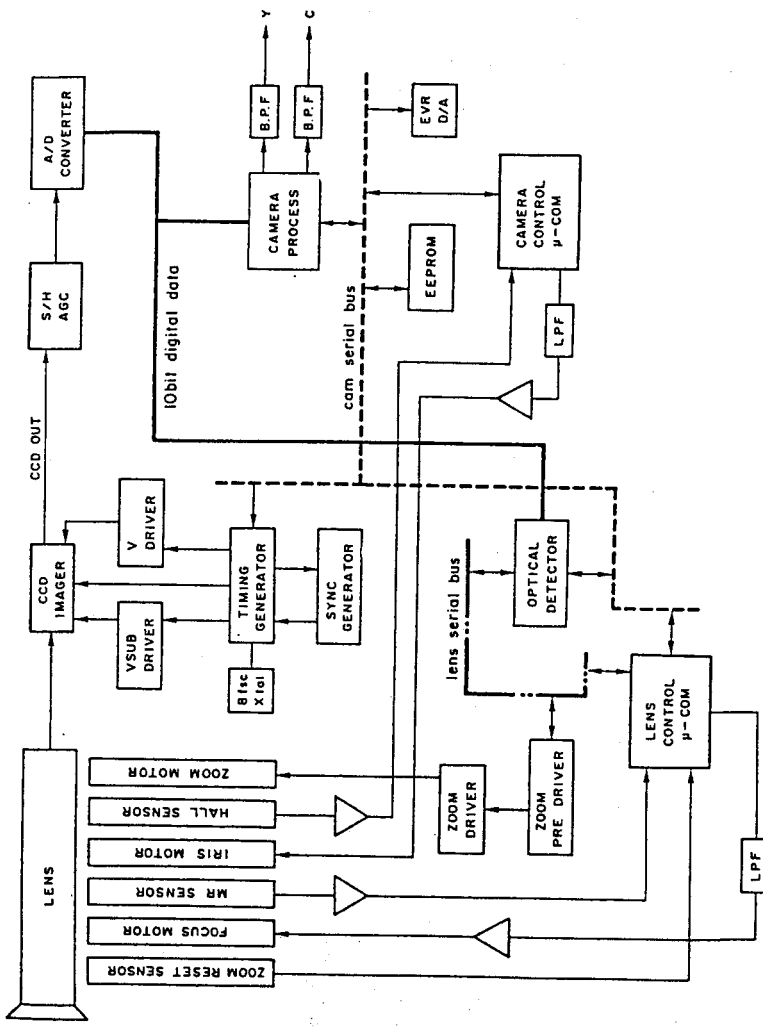
1. Summary

EVI-310 (NTSC) / EVI-311 (PAL) is a super compact color CCD camera block with 8 times zoom, high speed auto focus lens installed. A 1/3 inch, 380,000/440,000 pixels CCD is used and more than 460 TV lines, high resolution is achieved. Not only controlling zoom and focus but also auto tracing, one push, pre-set white balance are selectable and 17 steps iris, 28 speeds of electronic shutter, and 8 steps of brightness are possible to set by each. Owing to the Bright Control and Exposure Compensation function, various adjustments of brightness is offerable. Furthermore, it is possible to pre-set 6 different camera conditions in advance using Position Pre-set function. EVI-310/311 uses DSP (Digital Signal Processor) that enables digital controlling of each camera functions. Composite and Y/C outputs are available.

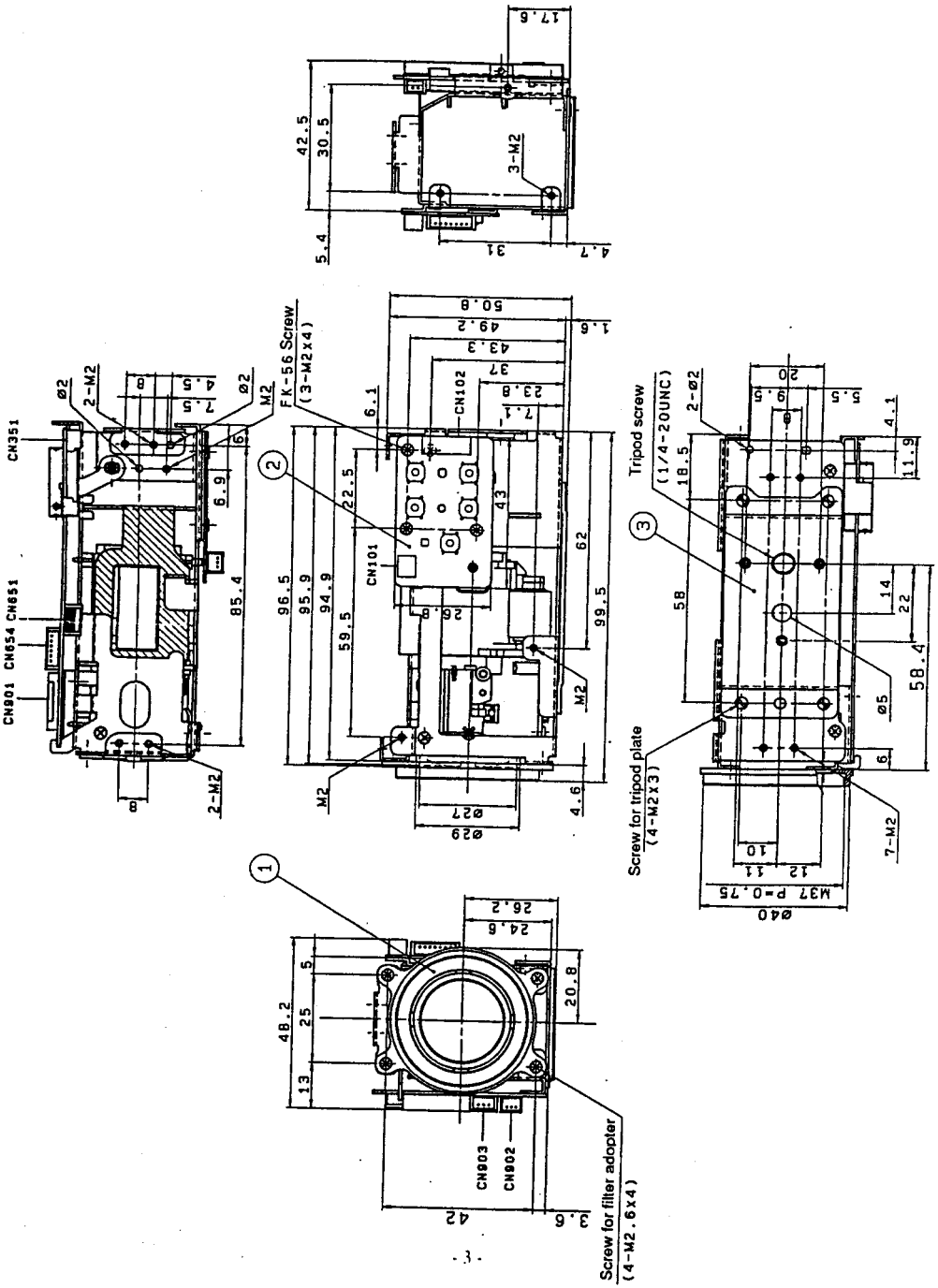
2. Specification

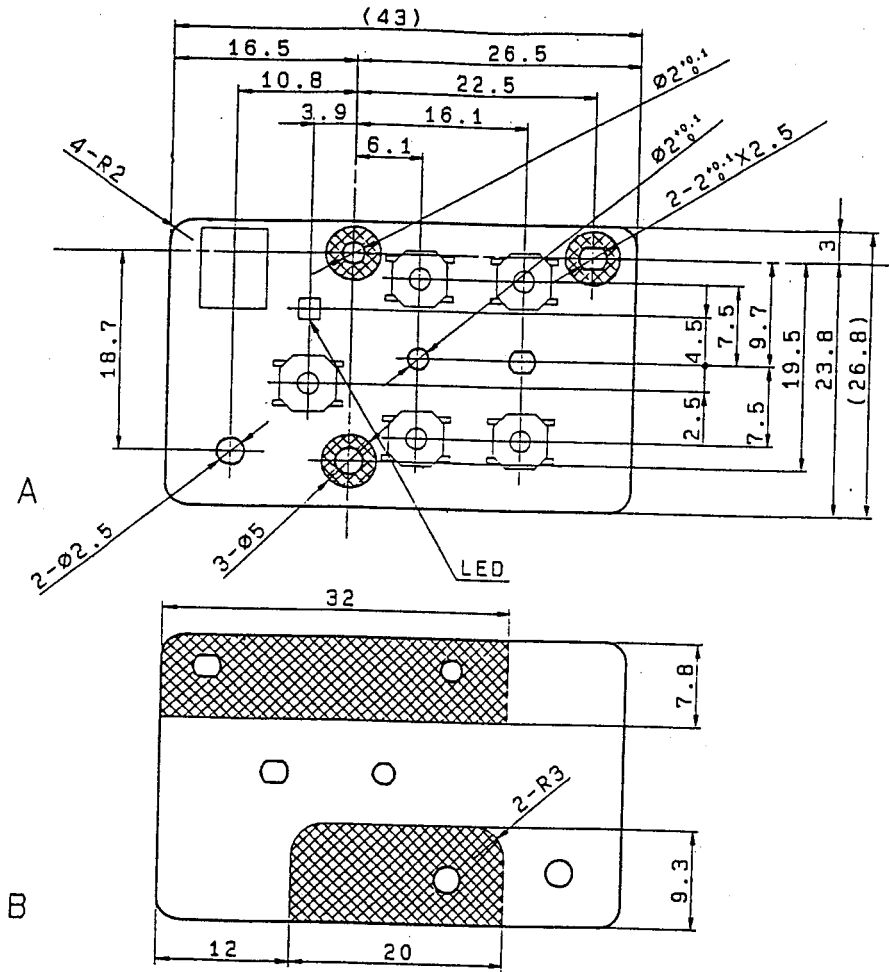
	EVI-310 (NTSC)	EVI-311 (PAL)
Image Sensor	1/3" IT CCD	
Picture Elements	768 (H) × 494 (V)	752 (H) × 582 (V)
H. Resolution (Center)	more than 460TV lines	more than 450TV lines
V. Resolution (Center)	more than 350TV lines	more than 400TV lines
Lens	8x Zoom f=5.9 to 47.2mm F1.4 Wide Macro Auto Focus (Inner Focus System)	
Angle of View (H) (V)	approx. 44.3° (wide end) to 5.8° (tele end) approx. 34.9° (wide end) to 4.4° (tele end)	
Lens constructure	9 elements in 6 groups (including 2 aspherical lenses)	
Shortest Subject Dist.	10mm (wide end) : 900mm (tele end)	
Video Out 75 Ω Terminated	Y:VS1.0Vp-p Sync negative C: Burst 0.286Vp-p VBS:1.0Vp-p Composite	Y:VS1.0Vp-p Sync negative C: Burst 0.300Vp-p VBS:1.0Vp-p Composite
Min. Illumination	6Lux F1.4 (more than 50IRE)	
S/N Ratio	more than 46dB	
White Balance	TTL Auto tracing, One push Hold, Indoor Preset, Outdoor Preset	
Electronic Shutter	28 speeds (up to 1/10000sec.)	28 speeds (up to 1/10000sec.)
Flickerless	Auto	
Operating Temperature	0℃ to 50℃	
Storage Temperature	-10℃ to 60℃	
Operating Humidity	30% to 80%	
Storage Humidity	20% to 90%	
Power Requirements	DC6 to 9V (2.8W)	
Dimensions(W/H/D)	49 × 51 × 100 mm	
Weight	210g	
Spurious radiation	FCC class A	
Supplied accessary	2P harness, 3P harness, 6P harness, 20P flexible cable	

3. Block Diagram



EVI-310/311


17.6
42.5
30.5
3-M2
5.4
31
4.7
50.8
49.2
43.3
37
23.8
7.1
1.6
6.1
CN102
FK-56 Screw
(3-M2x4)
2
22.5
CN101
43
62
99.5
96.5
95.9
94.9
59.5
26.8
M2
M2
ø27
ø29
4.6
CN351
ø2
2-M2
8
4.5
7.5
ø2
M2
6
6.9
85.4
CN901 CN654 CN651
8
2-M2
Tripod screw
(1/4-20UNC)
2-ø2
18.5
3
58
14
22
58.4
ø5
6
7-M2
Screw for tripod plate
(4-M2X3)
M37 P=0.75
ø40
10
11
12
1
24.6
26.2
20.8
48.2
25
13
5
CN903
CN902
42
3.6
Screw for filter adopter
(4-M2.6X4)


(43)
16.5
26.5
10.8
22.5
3.9
16.1
6.1
4-R2
Ø2+0.1 0
Ø2+0.1 0
2-2+0.1 0 X2.5
3
18.7
4.5
7.5
9.7
19.5
23.8
(26.8)
2.5
7.5
A
2-Ø2.5
3-Ø5
LED
32
7.8
2-R3
9.3
B
12
20

5. Input/Output Terminals

EVI-310/311

◇ CN902:3P Connect with FK-56 Board (CN101), For lens control

1. ZOOM/FOCUS
2. GND
3. AF ON LED

on board connector: SMK CGP4703-0110
supplied connectors housing: SMK CGP1203-0101
supplied connectors receptacle: SMK CTA1126-0101

◇ CN654:6P For Video Outputs

1. GND
2. C OUT
3. GND
4. Y OUT
5. GND
6. VBS OUT

on board: JST S6B-ZR-SM3A-TF
housing: JST ZHR-6
receptacle: JST SZH-003T-P0.5

◇ CN903:3P For ECCP and remote-controller (RM-95)

1. ECCP DC/UNREG OUT
2. ECCP SIG IN/OUT
3. GND

on board: JST S3B-ZR-SM3A-TF
housing: JST ZHR-3
receptacle: JST SZH-003T-P0.5

◇ CN351:2P For power supply

1. DC IN (6 to 9V)
2. GND

on board: JST S2B-ZR-SM3-TF
housing: JST ZHR-2
receptacle: JST SZH-003T-P0.5

※CN651 and CN653 are for SONY factory adjustment.

◇ CN901:20P For extra circuit

ELCO
00 6212 020 010 800

1. POSITION SW A
2. POSITION SW B
3. PRE/RST AWB
4. AE CONT
5. PO 1 LED
6. PO 2 LED
7. PO 3 LED
8. PO 4 LED
9. PO 5 LED
10. PO 6 LED
11. IN DOOR LED
12. OUT DOOR LED
13. AE LED
14. KEY LOCK LED
15. AWB LED
16. ONE PUSH WB LED
17. BACK LIGHT
18. BRIGHT
19. D 5V
20. GND

FK-56 BOARD

FK-56 Board is mounted at the side of the EVI-310/311 when it is delivered.
They are connected by 3P-3P harness.

◇ CN101:3P For connecting with EVI-310/311 (CN903)

1. ZOOM/FOCUS SW
2. GND
3. AF ON LED

on board connector: SMK CGP4703-0110
supplied connectors housing: SMK CGP1203-0101
supplied connectors receptacle: SMK CTA1126-0101

◇ CN102:7P For controlling zoom and focus

1. ZOOM WIDE
2. ZOOM TELE
3. AF ON/OFF
4. FOCUS NEAR
5. FOCUS FAR
6. GND
7. NC

JST
S7B-ZR-SM3A-TF

6. Functions

EVI-310/311 offers the following functions. For the details to control each function, please refer to Section 7 and 8.

Zoom

Owing to a high speed stepping motor as a zoom motor, the fastest 1.5 sec. zooming is achieved from tele end (47.2mm max.) to wide end (5.9mm max.) with 8 times zoom. Tele/wide manual control is available.

Focus

EVI-310/311 uses Inner focus system that gives a quick and stable tracking.
By detecting high frequency elements from the video signal , it focuses to the subject with much brightness and contrast in the measuring area of the center screen. Auto focus is available 1cm close-up from the lens front (in case of wide end) to infinite.
The closer to be Tele side, the longer the minimum focus distance will be.
When in tele end, it is focusable from 90 cm from the lens front.

For the following functions, controlling the functions with an additional circuit, ECCP, RS232C is necessary. When the following functions are not used, the first settings (factory settings) are auto white balance, 1/60 sec. shutter speed, auto iris, and AGC.

White balance

◇ Auto White Balance

TTL Auto Tracing White Balance System is used that gives a faithful color reproduction to the subject by calculating the color information of the whole screen. To prevent the subject from being all white by operating white balance function blindly, the operation range of auto white balance function is limited. This function also judges whether indoor or outdoor from the brightness and changes the withdraw range of auto white balance accordingly.

◇ Pre-set

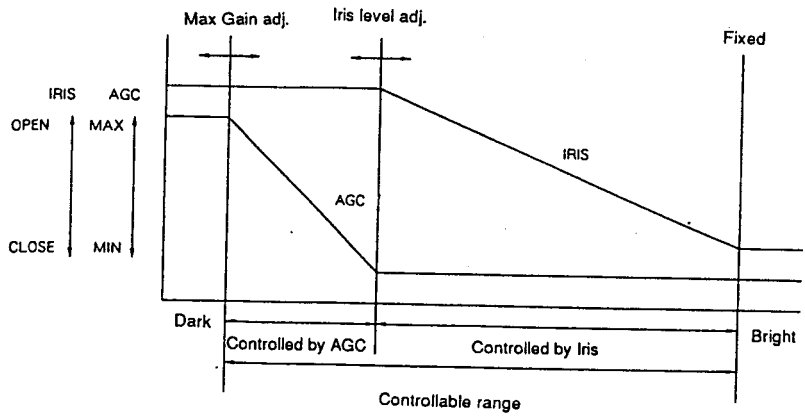
Indoor fix (3200K) and outdoor fix (5600K) are selectable.

◇ One push white balance

One push white balance function is a function to withdraw to white forcibly and capture an image under one fixed color temperature condition. Natural and faithful color is achieved without any influence from the changable conditions around the subject. When setting, send one push white balance trigger with white subject over half of the whole image occupied. The data of the one push white balance is cleared when turning off power supply. If power supply turned off once, re-set one push white balance.

Bright Control

Bright Control is an adjustment function of the brightness with the combination of gain and iris. When in darkness, gain controls exposure and when in the brightness, iris controls exposure. Since both gain and iris are fixed, this function is useful when capturing images under fixed brightness condition. The status at auto exposure will be held once when changing the mode from auto exposure to Bright Control.



STEP	GAIN	IRIS	STEP	GAIN	IRIS	STEP	GAIN	IRIS
1	18dB	F1.4	9	0dB	F2	17	0dB	F8
2	15dB	F1.4	10	0dB	F2.4	18	0dB	F9.6
3	12dB	F1.4	11	0dB	F2.8	19	0dB	F11
4	9dB	F1.4	12	0dB	F3.4	20	0dB	F14
5	6dB	F1.4	13	0dB	F4	21	0dB	F16
6	3dB	F1.4	14	0dB	F4.8	22	0dB	F19
7	0dB	F1.4	15	0dB	F5.6	23	0dB	CLOSE
8	0dB	F1.7	16	0dB	F6.8			

Exposure compensation

Exposure Compensation function is a brighter/darker adjustment function of the brightness when in auto (auto iris, AGC). The brightness when Exposure Compensation is OFF (auto iris, AGC) is a base (step 0) and each 7 steps to brighter and darker than the base condition (step 0) are adjustable. Iris and gain are in auto mode.

Shutter priority mode

Corresponding to selected electronic shutter speed (28 speeds), iris is adjusted automatically. Gain is in auto setting.

1	1/60 (PAL:1/50)	11	1/300	21	1/1750
2	1/60	12	1/350	22	1/2000
3	1/75	13	1/425	23	1/2500
4	1/90	14	1/500	24	1/3000
5	1/100	15	1/600	25	1/3500
6	1/125 (PAL:1/120)	16	1/725	26	1/4000
7	1/150	17	1/850	27	1/6000
8	1/180	18	1/1000	28	1/10000
9	1/215	19	1/1250		
10	1/250	20	1/1500		

Auto flickerless function

EVI-310/311 has auto flickerless function which reduces flicker automatically caused under fluorescent light in the area where electric wave frequency is different from the camera. To set to complete flickerless, set shutter speed to 1/100 sec.

Iris priority mode

Corresponding to selected iris position (17 different positions), shutter speed is adjusted automatically. Gain is in auto mode.

1	CLOSE	11	F4
2	F19	12	F3.4
3	F16	13	F2.8
4	F14	14	F2.4
5	F11	15	F2
6	F9.6	16	F1.7
7	F8	17	F1.4
8	F6.8		
9	F5.6		
10	F4.8		

Gain priority mode

Manual gain is set (8 different level). Shutter is in normal mode (1/60 : NTSC, 1/50 PAL) and gain is in auto mode.

1	-3dB
2	0dB
3	+3dB
4	+6dB
5	+9dB
6	+12dB
7	+15dB
8	+18dB

Position Pre-set

Using Position Pre-set function, 6 different camera conditions are pre-setable. With this useful function, camera is possible to be set as required instantly without adjusting zoom position, focus (auto, manual position), white balance, iris, gain, shutter speed, and bright control each time.

◇ Setting

After setting a camera functions as required, pre-set the camera to a preferable position number. When the position number is selected, each function will be set as memorized in advance. Once it is reset, the functions will be in full auto mode.

Factory Pre-set

With Position Pre-set function, the camera functions before pre-set and after reset are in full auto mode. However, with Factory Pre-set function, it is possible to keep the data semipermanently by writing the data into internal nonvolatile memory. Using this function, each camera functions before pre-set, after reset, and when turning on power supply ,when using position pre-set, are setable as desired.
Since a special tool is necessary, please contact us for the details.

7. Function Control

Each functions are controlled by different method.
Please refer to Section 8 for the details of function controlling method.

Control method / Controlable functions	FK-56	RM-95	VISCA /RS232C	ECCP	Extra Circuit
Zoom Tele/Wide	○	○	○	○	
Zoom Position (Preset/Detect)			○	○	
Focus Auto/Manual	○	○	○	○	
Focus Far/Near	○	○	○	○	
Focus Position (Preset/Detect)		○	○		
White Balance mode selection			○	○	○
White Balance mode detection			○	○	
Bright Control Up/Down			○	○	○
Exposure Compensation Up/Down		○	○	○	
Exp. Compensation (Preset/Detect)			○	○	
Shutter Priority Up/Down			○	○	
Shutter Priority (Preset/Detect)			○	○	
Iris Priority Up/Down			○	○	
Iris Priority (Preset/Detect)			○	○	
Gain Priority Up/Down			○	○	
Gain Priority (Preset/Detect)			○	○	
Position Preset (Preset/Reset)			○	○	○
Position Preset (Detect)			○	○	

8. Operation

Operation

◇ Power Supply

Please supply DC 7.5 ± 1.5V (2.8W) to CN 351 with accessory harness.
Red (No.1) is plus (+).

◇ Video Signal Output

Composite signal and YC video signal are output at CN 654.

◇ Backup Switch

- When backup switch is ON, positions of zoom and focus is memorized to the camera.
- Since backup battery is re-chargeable, exchanging is unnecessary.
- Backup lasts for two weeks when the battery is full charged.
- Factory setting is OFF.

Function Controlling

◇ FK-56 board

This board is used to control a lens. FK-56 board is removable from side frame of the camera.

■ Auto Focus ON/OFF

- Each time AF ON/OFF switch is pushed, ON/OFF is switched, and LED is lighted when Auto Focus is ON.
- When Auto Focus is OFF, the focus is adjustable by pushing Focus FAR or Focus NEAR switches. Adjustment is not available when Auto Focus is ON.

■ Zoom Adjustment

Zoom adjustment is available by pushing TELE or WIDE switches.

◇ ECCP (EVI Camera Control Protocol)

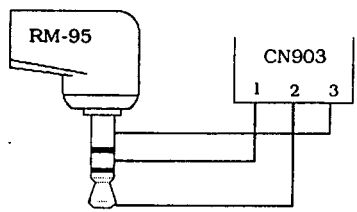
EVI-310/311 has ECCP terminals with which each camera function is controlled directly by serial communications (9600bits/sec., asyncronous interactive serial communications). It is possible to control the camera and read the camera data. To this ECCP terminals, remote controller (RM-95) and VISCA/RS 232C interface board are connectable. As to the details on ECCP usage, a contract is necessary so please contact us.

◇ VISCA / RS232C - with Interface Board/ IF-51

With Interface Board/IF-51 (extra charged optional accessary), each camera functions are controllable by RS232C port of a computer. It is possible to control a camera and read the camera data. IF-51 board can be fixed to the side of the camera body. In this case, FK-56 board has to be removed. Zoom and focus are operationable with buttons on IF-51 board. Please contact us for the details on VISCA/RS232C.

◇ Remote Controller - RM-95

With a remote controller, RM-95 for Sony consumer Camcorders, zooming and focus controlling are possible. Please connect to CN903 (3P) as below.



◇ Controlling with extra circuit

By adding a switch circuit, the following function will be controllable.
Use CN901 (20P) and accessory 20P flexible cable.

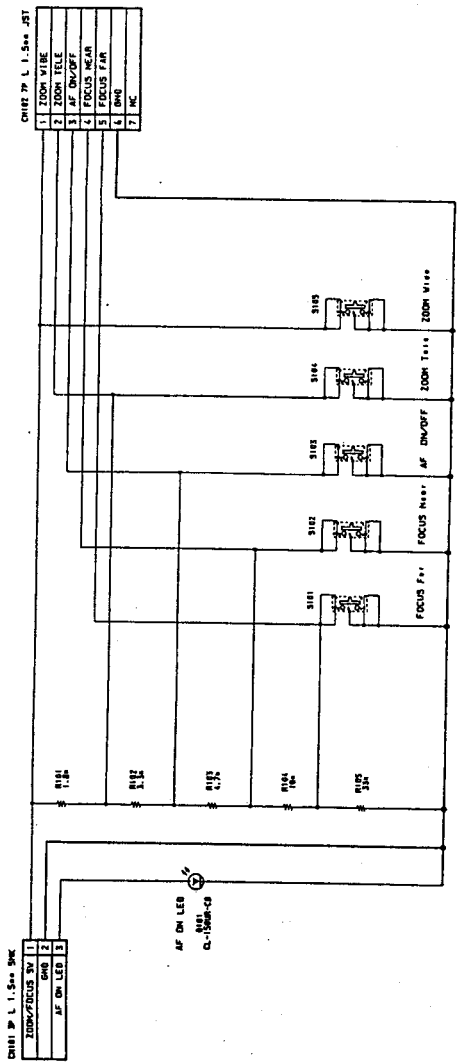
note: Please refer to the circuit daigram (page 15)

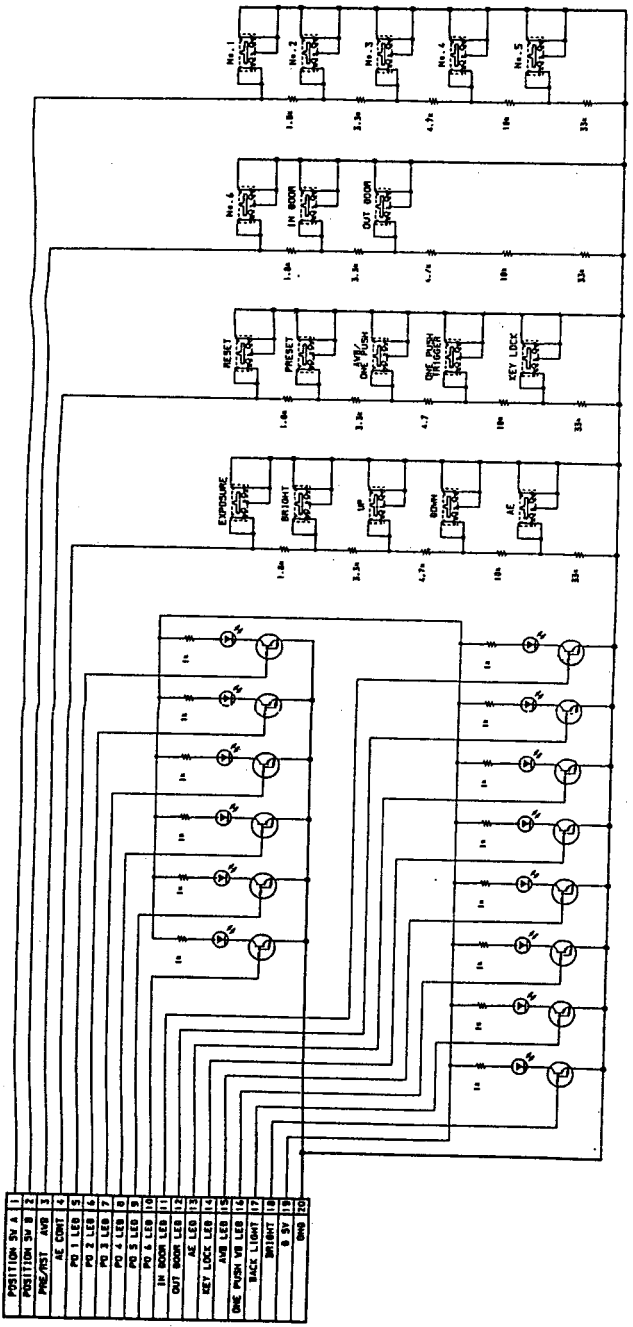
■CN901:20P

1.	POSITION SW A	11.	IN DOOR LED
2.	POSITION SW B	12.	OUT DOOR LED
3.	PRE/RST AWB	13.	AE LED
4.	AE CONT	14.	KEY LOCK LED
5.	PO 1 LED	15.	AWB LED
6.	PO 2 LED	16.	ONE PUSH WB LED
7.	PO 3 LED	17.	BACK LIGHT
8.	PO 4 LED	18.	BRIGHT
9.	PO 5 LED	19.	D 5V
10.	PO 6 LED	20.	GND

■Controlable Function

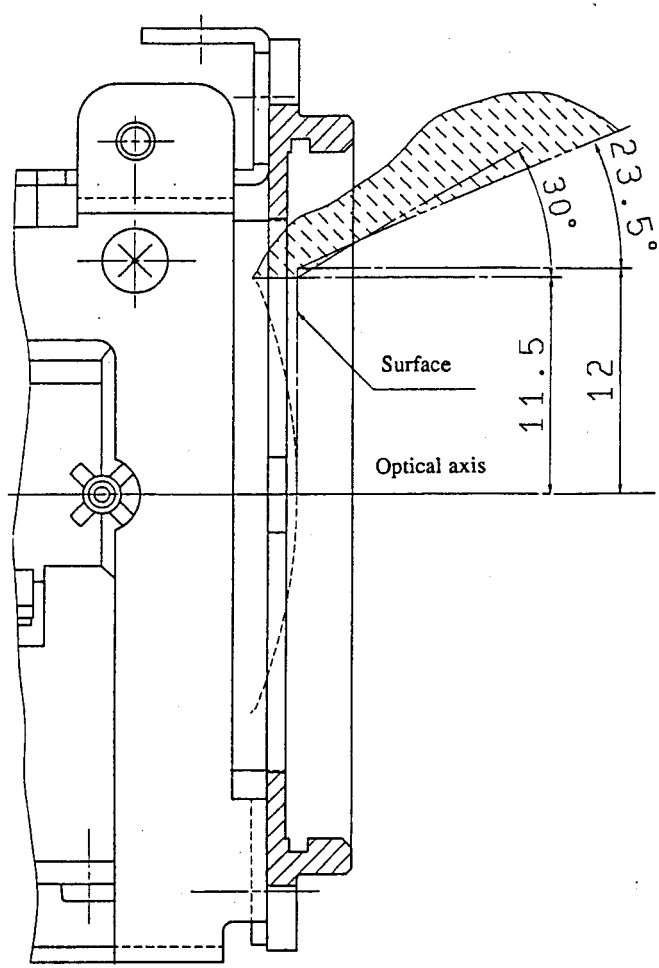
- White Balance
- Position Preset
- Bright Control
- Exposure Compensation


CN102 7P L 1.5mm JST
1 ZOOM WIDE
2 ZOOM TELE
3 AF ON/OFF
4 FOCUS NEAR
5 FOCUS FAR
6 GND
7 MC
CN101 3P L 1.5mm SMC
ZOOM/FOCUS SW
GND
AF ON LED
AF ON LED
R101 1.8k
R102 3.3k
R103 4.7k
R104 10k
R105 33k
S101
S102
S103
S104
S105
FOCUS Far
FOCUS Near
AF ON/OFF
ZOOM Tele
ZOOM Wide


No.1
No.2
No.3
No.4
No.5
No.6
IN ROOM
OUT ROOM
RESET
PRESET
AVB ONE PUSH
ONE PUSH TRIGGER
KEY LOCK
EXPOSURE
BRIGHT
UP
DOWN
AE
POSITION SW A
POSITION SW B
PRE/POST
AVB
AE CONT
PD 1 LED
PD 2 LED
PD 3 LED
PD 4 LED
PD 5 LED
PD 6 LED
IN ROOM LED
OUT ROOM LED
AE LED
KEY LOCK LED
AVB LED
ONE PUSH VB LED
BACK LIGHT
BRIGHT
5 SV
GND

◇ Installation

For installation, use tripod screw below or M2 screws on chasis.
It is possible to remove the plate for tripod.
In case of designing housing etc., please refere to the following drawing.



10. Note

- Do not add any force to bend printed circuit boards.
- Do not add voltage with over regular spec. (Max. 9V)
  Heat will be caused when using 9V voltage but it is not abnormal.
- To prevent electrostatic discharges, please use earth band when touching the boards.
  Please use untistatic processed material for packing.
- Please use a carton box shipped from Sony when you ship.
- A clatter might be heard when shaking a camera with power supply turned off.
  However, this clatter is caused by vibration of lenear motor inside of the lens.
  No quality problem.

11. Others

External synchronization is not available. RGB output is not available.

12 Optional Accessary

◇ Interface Board / IF-51

By using Interface Board/IF-51, it is possible to control camera functions through RS232C port of computers. IF-51 is possible to mount at the side of the camera. In this case, FK-56 Board should be taken off. Zoom and focus are possible to control also by the button on IF-51. Please ask for more details.

◇ Conversion lens

It is possible to adopt conversion lens (Φ 37) such as wide conversion lens or close up lens of consumer Camcorder.